

WHAT IS CLAIMED IS:

1. An image forming apparatus in which
5 applications can be installed, the image forming
apparatus comprising:

an application information obtaining part for
obtaining application information that is used for
determining whether an application is installable in
10 the image forming apparatus..

15 2. The image forming apparatus as claimed in
claim 1, wherein the application information obtaining
part obtains the application information from the
application.

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3. The image forming apparatus as claimed in
claim 2, wherein the application information is
25 information that is included in an execution file of

the application.

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4. The image forming apparatus as claimed in claim 1, wherein the application information obtaining part obtains the application information from a file separate from the application.

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5. The image forming apparatus as claimed in claim 3, wherein the application information obtaining part obtains the application information by provisionally launching the application.

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6. The image forming apparatus as claimed in claim 5, wherein the application information obtaining part obtains the application information by using interprocess communication between the application

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information obtaining part and the application.

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7. The image forming apparatus as claimed in claim 5, wherein the application causes the image forming apparatus to perform:

a step of determining whether to
10 provisionally launch the application or to normally launch the application according to a request from the application information obtaining part; and

a step of providing the application
information to the application information obtaining
15 part if the application is provisionally launched.

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8. The image forming apparatus as claimed in claim 1, the image forming apparatus further comprising a storage for storing the application information obtained by the application information obtaining part.

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9. The image forming apparatus as claimed in
claim 8, wherein the storage is at least one of a hard
5 disk, a nonvolatile memory and a memory card, and
wherein the application information obtaining part
obtains the application information by reading
information stored in the storage.

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10. The image forming apparatus as claimed in
claim 1, wherein the application information includes a
15 product ID that is specific for the application.

20 11. The image forming apparatus as claimed in
claim 10, wherein the application information further
includes at least one of a vendor name, an application
name, version information and resource information.

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12. The image forming apparatus as claimed in
claim 10, wherein the storage stores product IDs of
5 installable applications, and the image forming
apparatus determines whether a target application is
installable by checking whether a product ID of the
target application is stored.

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13. The image forming apparatus as claimed in
claim 1, the image forming apparatus further
15 comprising:

hardware resources used for image forming
process;

control services for controlling the hardware
resources; and

20 a virtual application service that operates
as a client process for the control services and
operates as a sever process for the application.

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14. The image forming apparatus as claimed in claim 13, wherein the virtual application service includes the application information obtaining part.

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15. A method used in an image forming apparatus in which applications can be installed, the method comprising:

an application information obtaining step of obtaining application information that is used for determining whether an application is installable in the image forming apparatus.

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16. The method as claimed in claim 15, wherein the image forming apparatus obtains the application information from the application.

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17. The method as claimed in claim 16,
wherein the application information is information that
is included in an execution file of the application.

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18. The method as claimed in claim 15,
10 wherein the image forming apparatus obtains the
application information from a file separate from the
application.

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19. The method as claimed in claim 17,
wherein the image forming apparatus obtains the
application information by provisionally launching the
20 application.

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20. The method as claimed in claim 19,

wherein the image forming apparatus obtains the application information from the application by using interprocess communication.

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21. The method as claimed in claim 19,
wherein the application causes the image forming
10 apparatus to perform:
a step of determining whether to
provisionally launch the application or to normally
launch the application according to a request; and
a step of providing the application
15 information to the image forming apparatus if the
application is provisionally launched.

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22. The method as claimed in claim 15, the
method further comprising a step of storing the
application information in a storage in the image
forming apparatus.

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23. The method as claimed in claim 22,
5 wherein the storage is at least one of a hard disk, a
nonvolatile memory and a memory card, and wherein the
image forming apparatus obtains the application
information by reading information stored in the
storage.

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24. The method as claimed in claim 15,
15 wherein the application information includes a product
ID that is specific for the application.

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25. The method as claimed in claim 24,
wherein the application information further includes at
least one of a vendor name, an application name,
version information and resource information.

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26. The method as claimed in claim 24,
5 wherein the storage stores product IDs of installable
applications, and the image forming apparatus
determines whether a target application is installable
by checking whether a product ID of the target
application is stored.

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27. A computer program to be executed on an
15 image forming apparatus in which applications can be
installed, the computer program comprising:

application information obtaining program
code means for obtaining application information that
is used for determining whether an application is
20 installable in the image forming apparatus.

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28. A computer readable medium storing

program code to be executed on an image forming apparatus in which applications can be installed, the computer readable medium comprising:

application information obtaining program
5 code means for obtaining application information that is used for determining whether an application is installable in the image forming apparatus.

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29. An image forming apparatus including an operation panel for displaying or inputting operation information, the image forming apparatus comprising:

15 an information obtaining part for obtaining application information on an application to be used in the image forming apparatus; and

a display part for displaying the application information or information related to the application
20 information on the operation panel.

25 30. The image forming apparatus as claimed in

claim 29, the image forming apparatus further comprising:

a determination part for determining whether the application is installable in the image forming apparatus according to the application information
5 obtained by the information obtaining part.

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31. The image forming apparatus as claimed in claim 30, wherein the display part displays one or more installable applications on the operation panel according to the result of determination by the
15 determination part, wherein an installable application can be selected from the one or more installable applications.

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32. The image forming apparatus as claimed in claim 31, wherein the display part displays information including application names and application outline
25 descriptions for the one or more applications.

5 33. The image forming apparatus as claimed in
claim 30, wherein the display part displays a reason
why an application is not installable according to the
result of determination by the determination part.

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 34. The image forming apparatus as claimed in
claim 30, wherein the display part displays a warning
15 when an application selected for install is already
installed in the image forming apparatus.

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 35. The image forming apparatus as claimed in
claim 29, wherein the application information or the
information related to the application information that
is displayed on the operation panel includes
25 information necessary for determining whether the

application is installable.

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36. The image forming apparatus as claimed in claim 35, wherein the information necessary for determining whether the application is installable includes version information of the application and
10 version information of the image forming apparatus.

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37. The image forming apparatus as claimed in claim 35, wherein the information necessary for determining whether the application is installable includes necessary resource information of the application and available resource information of the
20 image forming apparatus.

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38. The image forming apparatus as claimed in

claim 29, wherein the display part displays an install operation screen or an uninstall operation screen by using the application information,

the image forming apparatus further

5 comprising:

a part for performing install process or uninstall process for the application according to operations on the install operation screen or the uninstall operation.

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39. The image forming apparatus as claimed in claim 29, the image forming apparatus further comprising a part for causing a remote apparatus to display a screen that is the same as a screen displayed on the operation panel.

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40. A method used for displaying operation information on an operation panel in an image forming apparatus, the image forming apparatus comprising:

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an information obtaining step of obtaining application information on an application to be used in the image forming apparatus; and

a display step of displaying the application information or information related to the application information on the operation panel.

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41. The method as claimed in claim 40, the method further comprising:

a determination step of determining whether the application is installable in the image forming apparatus according to the application information.

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42. The method as claimed in claim 41, wherein the image forming apparatus displays one or more installable applications on the operation panel according to the result of the determination step, wherein an installable application can be selected from the one or more installable applications.

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5 43. The method as claimed in claim 42,
wherein the image forming apparatus displays
information including application names and application
outline descriptions for the one or more applications.

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 44. The method as claimed in claim 41,
wherein the image forming apparatus displays a reason
15 why an application is not installable according to the
result of the determination step.

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 45. The method as claimed in claim 41,
wherein the image forming apparatus displays a warning
when an application selected for install is already
installed in the image forming apparatus.

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46. The method as claimed in claim 40,
5 wherein the application information or the information
related to the application information that is
displayed on the operation panel includes information
necessary for determining whether the application is
installable.

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47. The method as claimed in claim 46,
15 wherein the information necessary for determining
whether the application is installable includes version
information of the application and version information
of the image forming apparatus.

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48. The method as claimed in claim 46,
wherein the information necessary for determining
25 whether the application is installable includes

necessary resource information of the application and
available resource information of the image forming
apparatus.

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49. The method as claimed in claim 40,
wherein the image forming apparatus displays an install
10 operation screen or an uninstall operation screen by
using the application information,

wherein the image forming apparatus performs
install process or uninstall process for the
application according to operations on the install
15 operation screen or the uninstall operation.

20 50. The method as claimed in claim 40,
wherein the image forming apparatus causes a remote
apparatus to display a screen that is the same as a
screen displayed on the operation panel.

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51. A computer program to be executed on an
image forming apparatus including an operation panel
5 for displaying or inputting operation information, the
computer program comprising:

information obtaining program code means for
obtaining application information on an application to
be used in the image forming apparatus; and

10 display program code means for displaying the
application information or information related to the
application information on the operation panel.

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52. A computer readable medium storing
program code to be executed on an image forming
apparatus including an operation panel for displaying
20 or inputting operation information, the computer
readable medium comprising:

information obtaining program code means for
obtaining application information on an application to
be used in the image forming apparatus; and

25 display program code means for displaying the

application information or information related to the application information on the operation panel.

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53. An image forming apparatus in which a plurality of applications can be installed, the image forming apparatus comprising:

10 an information obtaining part for obtaining necessary resource information for executing an application and available resource information in the image forming apparatus; and

 a launch restriction part for comparing the
15 necessary resource information and the available resource information, and performing launch restriction process on the application according to the result of comparison between the necessary resource information and the available resource information.

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54. The image forming apparatus as claimed in
25 claim 53, wherein the information obtaining part

obtains the necessary resource information from an
execution file of the application.

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55. The image forming apparatus as claimed in
claim 54, wherein the information obtaining part
obtains the necessary resource information by
10 provisionally launching the application.

15 56. The image forming apparatus as claimed in
claim 53, wherein the information obtaining part
obtains, as the necessary resource information, a usage
record of a resource used by the application.

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57. The image forming apparatus as claimed in
claim 56, wherein the information obtaining part
25 obtains the usage record from system information that

holds usage records used by processes in the image forming apparatus.

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58. The image forming apparatus as claimed in claim 53, wherein the information obtaining part obtains, as the necessary resource information, a
10 memory area size to be used by the application.

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59. The image forming apparatus as claimed in claim 58, wherein the memory area size is a heap area size.

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60. The image forming apparatus as claimed in claim 53, wherein the necessary resource information indicates a necessary resource amount and the available
25 resource information indicates an available resource

amount, and wherein the launch restriction part displays a ratio of the necessary resource amount to the available resource amount on an operation panel.

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61. The image forming apparatus as claimed in claim 53, wherein the necessary resource information indicates a necessary resource amount and the available resource information indicates an available resource amount, and wherein the launch restriction part displays a warning on an operation panel when the necessary resource amount is larger than the available resource amount.

20 62. The image forming apparatus as claimed in claim 61, wherein, if the application can operate by using a second resource that is different from a first resource corresponding to the necessary resource amount, the launch restriction part causes the application to
25 use the second resource instead of the first resource.

5 63. The image forming apparatus as claimed in
claim 53, wherein the necessary resource information
indicates an apparatus that is to be used by the
application, and wherein the launch restriction part
performs the launch restriction process when the image
10 forming apparatus is not provided with the apparatus.

15 64. The image forming apparatus as claimed in
claim 53, the image forming apparatus further
comprising:

hardware resources used for image forming
processes;

20 control services for controlling the hardware
resources; and

a virtual application service that operates
as a client process for the control services and
operates as a sever process for the application.

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65. The image forming apparatus as claimed in
5 claim 64, wherein the virtual application service
includes the information obtaining part and the use
restriction part.

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66. A launch restriction method used in an
image forming apparatus in which a plurality of
applications can be installed, the launch restriction
15 method comprising:

an information obtaining step of obtaining
necessary resource information for executing an
application and available resource information in the
image forming apparatus; and

20 a launch restriction step of comparing the
necessary resource information and the available
resource information, and performing launch restriction
process on the application according to the result of
comparison between the necessary resource information
25 and the available resource information.

5 67. The launch restriction method as claimed
in claim 66, wherein the image forming apparatus
obtains the necessary resource information from an
execution file of the application.

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 68. The launch restriction method as claimed
in claim 67, wherein the image forming apparatus
15 obtains the necessary resource information from the
execution file of the application by provisionally
launching the application.

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 69. The launch restriction method as claimed
in claim 66, wherein the image forming apparatus
obtains, as the necessary resource information, a usage
25 record of a resource used by the application.

5 70. The launch restriction method as claimed
in claim 69, wherein the image forming apparatus
obtains the usage record from system information that
holds usage records used by processes in the image
forming apparatus.

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 71. The launch restriction method as claimed
15 in claim 66, wherein the image forming apparatus
obtains, as the necessary resource information, a
memory area size to be used by the application.

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 72. The launch restriction method as claimed
in claim 71, wherein the memory area size is a heap
area size.

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73. The launch restriction method as claimed
5 in claim 66, wherein the necessary resource information
indicates a necessary resource amount and the available
resource information indicates an available resource
amount, and wherein the image forming apparatus
displays a ratio of the necessary resource amount to
10 the available resource amount on an operation panel.

15 74. The launch restriction method as claimed
in claim 66, wherein the necessary resource information
indicates a necessary resource amount and the available
resource information indicates an available resource
amount, and wherein the image forming apparatus
20 displays a warning on an operation panel when the
necessary resource amount is larger than the available
resource amount.

75. The launch restriction method as claimed
in claim 74, wherein, if the application can operate by
using a second resource that is different from a first
5 resource corresponding to the necessary resource amount,
the image forming apparatus causes the application to
use the second resource instead of the first resource.

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76. The launch restriction method as claimed
in claim 66, wherein the necessary resource information
indicates an apparatus that is to be used by the
15 application, and wherein the image forming apparatus
performs the launch restriction process when the image
forming apparatus is not provided with the apparatus.

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77. The launch restriction method as claimed
in claim 66, the image forming apparatus comprising:
hardware resources used for image forming
25 processes;

control services for controlling the hardware resources; and

a virtual application service that operates as a client process for the control services and
5 operates as a sever process for the application.

10 78. The launch restriction method as claimed in claim 77, wherein information obtaining step and the launch restriction step are performed by the virtual application service.

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79. A computer program to be executed on an image forming apparatus in which a plurality of
20 applications can be installed, the computer program comprising:

information obtaining program code means for obtaining necessary resource information for executing an application and available resource information in
25 the image forming apparatus; and

launch restriction program code means for
comparing the necessary resource information and the
available resource information, and performing launch
restriction process on the application according to the
5 result of comparison between the necessary resource
information and the available resource information.

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80. A computer readable medium storing
program code to be executed on an image forming
apparatus in which a plurality of applications can be
installed, the computer readable medium comprising:

15 information obtaining program code means for
obtaining necessary resource information for executing
an application and available resource information in
the image forming apparatus; and

launch restriction program code means for
20 comparing the necessary resource information and the
available resource information, and performing launch
restriction process on the application according to the
result of comparison between the necessary resource
information and the available resource information.

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81. An image forming apparatus in which a
5 plurality of applications can be installed, the image
forming apparatus comprising:

a part for referring to a database which
includes, for each application, information on
propriety of combination of applications; and
10 a launch control part for performing launch
control process on an application according to the
information on propriety.

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82. The image forming apparatus as claimed in
claim 81, wherein the information on propriety
indicates incompatible relationship or unrecommended
20 relationship among a plurality of applications, and
the launch control part displays a screen for
selecting at least one application from among the
plurality of applications on an operation panel.

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83. The image forming apparatus as claimed in
claim 81, wherein the information on propriety
5 indicates incompatible relationship or unrecommended
relationship among a plurality of applications, and
the launch control part launches at least one
application among the plurality of applications or
performs launch setting on at least one application
10 among the plurality of applications.

15 84. The image forming apparatus as claimed in
claim 83, wherein the launch control part launches an
application having the highest priority among the
plurality of applications or performs launch setting on
the application having the highest priority.

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85. The image forming apparatus as claimed in
25 claim 81, wherein the information on propriety

indicates incompatible relationship or unrecommended
relationship among a plurality of applications, and
the lunch control part displays a warning
screen on an operation panel when combination of
5 applications is unrecommended.

10 86. The image forming apparatus as claimed in
claim 82, wherein, when a launch request or a launch
setting request is made for a first application, the
launch control part refers to the database, obtains an
identifier of a second application that is incompatible
15 or unrecommended against the first application, and
performs the launch control process on the first and
second applications.

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87. The image forming apparatus as claimed in
claim 81, wherein the information on propriety
indicates incompatible relationship or unrecommended
25 relationship among a plurality of applications, and

indicates a level of the incompatible relationship or the unrecommended relationship, and

the launch control part performs the launch control process according to the level.

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88. The image forming apparatus as claimed in claim 81, wherein the information on propriety indicates indispensable relationship or recommended relationship among a plurality of applications, and

the launch control part displays a screen showing an indispensable or recommended application for another application on an operation panel.

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89. The image forming apparatus as claimed in claim 81, wherein the information on propriety indicates indispensable relationship or recommended relationship among a plurality of applications, and

the launch control part launches an indispensable or recommended application for another

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application, or performs launch setting on the indispensable or recommended application for another application.

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90. The image forming apparatus as claimed in claim 88, wherein, when the indispensable or recommended application is not installed in the image forming apparatus, the launch control part downloads the indispensable or recommended application from a server via a network.

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91. The image forming apparatus as claimed in claim 88, wherein, when the indispensable or recommended application is not installed in the image forming apparatus, the launch control part displays information that can be used for obtaining the indispensable or recommended application.

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92. The image forming apparatus as claimed in
claim 88, wherein, when a launch request or a launch
5 setting request is made for a first application, the
launch control part refers to the database, obtains an
identifier of a second application that is
indispensable or recommended for the first application,
and performs the launch control process on the first
10 and second applications.

15 93. The image forming apparatus as claimed in
claim 81, wherein the information on propriety
indicates indispensable relationship or recommended
relationship among a plurality of applications, and
indicates a level of the indispensable relationship or
20 the recommended relationship, and
the launch control part performs the launch
control process according to the level.

94. The image forming apparatus as claimed in claim 81, the image forming apparatus further comprising:

5 hardware resources used for image forming processes;

control services for controlling the hardware resources; and

10 a virtual application service that operates as a client process for the control services and operates as a sever process for the application.

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95. The image forming apparatus as claimed in claim 94, wherein the virtual application service includes the part for referring and the launch control part.

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96. A launch control method used in an image forming apparatus in which a plurality of applications

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can be installed, the launch control method comprising:

a step of referring to a database which includes, for each application, information on propriety of combination of applications; and

5 a launch control step of performing launch control process on an application according to the information on propriety.

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97. The launch control method as claimed in claim 96, wherein the information on propriety indicates incompatible relationship or unrecommended
15 relationship among a plurality of applications, and

the image forming apparatus displays a screen for selecting at least one application from among the plurality of applications on an operation panel.

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98. The launch control method as claimed in claim 96, wherein the information on propriety
25 indicates incompatible relationship or unrecommended

relationship among a plurality of applications, and
the image forming apparatus launches at least
one application among the plurality of applications or
performs launch setting on at least one application
5 among the plurality of applications.

10 99. The launch control method as claimed in
claim 98, wherein the image forming apparatus launches
an application having the highest priority among the
plurality of applications or performs launch setting on
the application having the highest priority.

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100. The launch control method as claimed in
20 claim 96, wherein the information on propriety
indicates incompatible relationship or unrecommended
relationship among a plurality of applications, and
the image forming apparatus displays a
warning screen on an operation panel when combination
25 of applications is unrecommended.

5 101. The launch control method as claimed in
claim 97, wherein, when a launch request or a launch
setting request is made for a first application, the
image forming apparatus refers to the database, obtains
an identifier of a second application that is
10 incompatible or unrecommended against the first
application, and performs the launch control process on
the first and second applications.

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 102. The launch control method as claimed in
claim 96, wherein the information on propriety
indicates incompatible relationship or unrecommended
20 relationship among a plurality of applications, and
indicates a level of the incompatible relationship or
the unrecommended relationship, and

 the image forming apparatus performs the
launch control process according to the level.

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103. The launch control method as claimed in
5 claim 96, wherein the information on propriety
indicates indispensable relationship or recommended
relationship among a plurality of applications, and
the image forming apparatus displays a screen
showing an indispensable or recommended application for
10 another application on an operation panel.

15 104. The launch control method as claimed in
claim 96, wherein the information on propriety
indicates indispensable relationship or recommended
relationship among a plurality of applications, and
the image forming apparatus launches an
20 indispensable or recommended application for another
application, or performs launch setting on the
indispensable or recommended application for another
application.

105. The launch control method as claimed in
claim 103, wherein, when the indispensable or
5 recommended application is not installed in the image
forming apparatus, the image forming apparatus
downloads the indispensable or recommended application
from a server via a network.

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106. The launch control method as claimed in
claim 103, wherein, when the indispensable or
15 recommended application is not installed in the image
forming apparatus, the image forming apparatus displays
information that can be used for obtaining the
indispensable or recommended application.

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107. The launch control method as claimed in
claim 103, wherein, when a launch request or a launch
25 setting request is made for a first application, the

image forming apparatus refers to the database, obtains
an identifier of a second application that is
indispensable or recommended for the first application,
and performs the launch control process on the first
5 and second applications.

10 108. The launch control method as claimed in
claim 96, wherein the information on propriety
indicates indispensable relationship or recommended
relationship among a plurality of applications, and
indicates a level of the indispensable relationship or
15 the recommended relationship, and

the image forming apparatus performs the
launch control process according to the level.

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109. The launch control method as claimed in
claim 96, the image forming apparatus comprising:
hardware resources used for image forming
25 processes;

control services for controlling the hardware resources; and

a virtual application service that operates as a client process for the control services and
5 operates as a sever process for the application.

10 110. The launch control method as claimed in claim 109, wherein the step of referring to the database and the launch control step are performed by the virtual application service.

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111. A computer program to be executed on an image forming apparatus in which a plurality of
20 applications can be installed, the computer program comprising:

program code means for referring to a database which includes, for each application, information on propriety of combination of
25 applications; and

launch control program code means for performing launch control process on an application according to the information on propriety.

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112. A computer readable medium storing program code to be executed on an image forming apparatus in which a plurality of applications can be installed, the computer readable medium comprising:

program code means for referring to a database which includes, for each application, information on propriety of combination of applications; and

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launch control program code means for performing launch control process on an application according to the information on propriety.

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